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First Named Inventor or Application Identifier		Takayuki Sugahara	
Title	RECORDING APPARATUS AND RECORDING METHOD OF ELECTRONIC WATERMARK		
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<b>APPLICATION ELEMENTS</b>	ADDRESS TO: Assistant Commissioner for Patents Box Applications Washington, D.C. 20231
1. <input checked="" type="checkbox"/> Filing fee as calculated below. 2. <input checked="" type="checkbox"/> Specification [Total Pages <b>[20]</b> ] <i>(preferred arrangement set forth below)</i> - Descriptive title of the invention - Cross References to Related Applications - Statement Regarding Fed sponsored R & D - Reference to Microfiche Appendix - Background of the Invention - Brief Summary of the invention - Brief Description of the Drawings (if filed) - Detailed Description - Claim(s) - Abstract of the Disclosure 3. <input checked="" type="checkbox"/> Drawing(s) (35 USC 113) [Total Pages <b>[3]</b> ] 4. Oath or Declaration [Total Pages <b>[3]</b> ] a. <input checked="" type="checkbox"/> Newly executed (original or copy) b. <input type="checkbox"/> Copy from a prior application (37 CFR 1.63(d)) <i>(for continuation/divisional with Box 17 completed)</i> <input type="checkbox"/> <b>DELETION OF INVENTOR(S)</b> Signed statement attached deleting inventor(s) named in the prior application, see 37 CFR 1.63(d)(2) and 1.33(b) 5. <input type="checkbox"/> Incorporation By Reference (useable if Box 4b is checked) The entire disclosure of the prior application, from which a copy of the oath or declaration is supplied under Box 4b, is considered as being part of the disclosure of the accompanying application and is hereby incorporated by reference therein.	6. <input type="checkbox"/> Microfiche Computer Program (Appendix) 7. <input type="checkbox"/> Nucleotide and/or Amino Acid Sequence Submission (if applicable, all necessary) a. <input type="checkbox"/> Computer readable copy b. <input type="checkbox"/> Paper Copy (identical to computer copy) c. <input type="checkbox"/> Statement Verifying identity of above copies 8. <input checked="" type="checkbox"/> Assignment papers (cover sheet & document(s)) 9. <input type="checkbox"/> 37 CFR 3.73(b) Statement <input type="checkbox"/> Power of Attorney 10. <input type="checkbox"/> English Translation Document (if applicable) 11. <input checked="" type="checkbox"/> Information Disclosure <input type="checkbox"/> Copies of IDS Statement (IDS)/PTO-1449 Citations 12. <input type="checkbox"/> Preliminary Amendment 13. <input checked="" type="checkbox"/> Return Receipt Postcard (MPEP 503) <i>(Should be specifically itemized)</i> 14. <input type="checkbox"/> Small Entity <input type="checkbox"/> Statement filed in prior application, Statement(s) Status still proper and desired 15. <input checked="" type="checkbox"/> Certified copy of Priority Document(s) <i>(if foreign priority is claimed)</i> 14. <input type="checkbox"/> Other:

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<b>TOTAL</b>	4	minus	20	=	0	x9=	\$	x18=	\$0.00			
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<i>Signature</i>			<i>Date</i>
			6/20/00

# US PATENT APPLICATION

Title of Invention: RECORDING APPARATUS AND RECORDING METHOD OF  
ELECTRONIC WATERMARK

Filing No. & Date:

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# RECORDING APPARATUS AND RECORDING METHOD OF ELECTRONIC WATERMARK

## BACKGROUND OF THE INVENTION

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### Field of the Invention:

The present invention relates to a recording of contents information recorded with an electronic watermark signal therein, particularly, relates to a recording apparatus and a recording method of an electronic watermark, wherein an electronic watermark signal is always held when a part of contents information is extracted and recorded.

15 Description of the Related Art:

An electronic watermark is a technique of embedding a certain information in a multimedia data such as image and sound and concealing the certain information. There provided various methods of concealing.

20 The NTT Human Interface Laboratory reported "An Embedding Method of Copyright Information using DCT for Digital Moving Pictures" in the SCIS'97-31G. It proposes the method of embedding information in the MPEG (Moving Picture Experts Group) code, particularly, the method of embedding information based upon alteration of DCT (discrete cosine transform) coefficient, a motion vector and quantization characteristics.

The Defense Academy of Japan reported "A Method of

Signing Watermark on a Picture by PN Succession” in the SCIS’97-26B. It proposes the method of diffusing a picture signal by the PN succession and synthesizing a signature information with the picture in accordance with the direct diffusion method.

5 G. Caronni proposed that a tag, which is a small geometrical pattern, was added to an electronically processed picture in an intensity level, which is hardly perceived visibly, is proposed in the thesis titled “Assuring Ownership Rights for Digital Images” in the Proc. Reliable IT Systems, VIS’95, 1995. A method of  
10 embedding an electronic watermark signal, which is resemble to quantization noise is described in the theses “Embedding Secret Information into a Dithered Multi-level Image” in the IEEE Military Comm. Conference, pp. 216-220, 1990 by K. Tanaka and “Video-steganography” in the IMA Intellectual Property Proc., VI,  
15 pp. 187-206, 1994 by K. Mitsui et al. respectively.

A method of inserting an electronic watermark signal into a pixel allocated in a vicinity of an outline of picture in the least significant bit is described in the thesis titled “Cryptology for Digital TV Broadcasting”, Proc. of the IEEE, 83(6), pp. 944-957,  
20 1995, by Macq and Quisquater.

A statistical method called “patchwork” and a method of utilizing a random texture pattern, which is shown in a picture called “texture block coding” is explained in the thesis titled “Techniques for Data Hiding”, Proc. of SPIE, v2420, page 40, July  
25 1995, by W. Bender et al.

MPEG signal, which is one of compressed signals, to be inserted with an electronic watermark signal is depicted next. Essentially MPEG is a name of organization, “Moving Picture

Experts Group". However, it currently represents standards or specifications for coding signals. Accordingly, MPEG is composed of several techniques.

Fig. 6 shows a block diagram of the MPEG encoder according to the prior art.

In Fig. 6, the MPEG encoder comprises a predictor 41 for motion compensation, a subtracter 42, a discrete cosine transformer (DCT) 43, a quantizer 44, a VLC (variable length coder) 45, a buffer 46, an inverse-quantizer 47, an inverse-DCT 48, an adder 49 and a memory 50 for picture.

In the subtracter 42, a difference between an input picture signal and a locally decoded picture, which is predicted for motion compensation by the predictor 41, is subtracted from the input picture signal. Accordingly, a time redundancy portion is deleted from the input picture signal. There exist 3 modes of predicting directions: "past", "future" and "both past and future". Further, these modes can be used by switching each macro block (MB) of 16 pixels multiplied by 16 pixels. A direction of prediction is decided by a picture-type given to the input picture signal. There is existed 2 modes of "predicting from past" and "encoding an MB independently without predicting" in a predictive coded picture (P-picture). There is existed 4 modes of predicting "future", "past", "both past and future" and "encoding a MB independently without predicting" in a bi-directionally predictive coded picture (B-picture). Furthermore, encoding all MBs independently is an intra-coded picture (I-picture).

A motion vector is detected with the accuracy of half pel or half-pixel after performing a pattern matching of a motion area at

each MB and motion compensation is predicted by shifting it with a motion component. There is existed 2 directions of horizontal and vertical in a motion vector. The direction is transmitted as an additional information of MB in conjunction with a motion compensation (MC) mode, which indicates a prediction from where. From a first I-picture to a picture preceding a second I-picture is called a group of pictures (GOP). In a case that the GOP is used in storage media such as an optical recording medium and a magnetic recording medium, approximately 15 pictures are used in general.

10 A differential picture is orthogonally transformed in the DCT 43. According to MPEG, the 2-dimensional DCT is applied to a DCT block of  $8 \times 8$  with dividing one MB into 4. Generally, a video signal contains more low frequency components and less high frequency components, so that DCT coefficients converge into low frequency components if the DCT is applied.

15 The picture data (DCT coefficient) applied by the DCT is quantized by the quantizer 44.

The quantized data is processed with the variable length coding (VLC) by the VLC 45.

20 The data coded by VLC is temporarily stored in the buffer 46 and outputted as a coded data in a predetermined transfer rate. A generated coding amount per MB of the data to be outputted is transferred to a code amount limiter not shown. The code amount limiter controls a quantizing scale by feeding an error code amount, which is a difference between the generated code amount and a target code amount, back to the quantizer 44 for controlling the generated code amount.

25 Further, the quantized picture data is inversely quantized by

the inverse-quantizer 47 and inversely discrete cosine transformed by the inverse-DCT 48 and temporarily stored in the memory 50 through the adder 49, and then the quantized picture data is used in the predictor 41 for motion compensation as reference of a decoding picture or a local decoding picture so as to calculate a differential picture.

The coded data outputted from the buffer 46 is decoded through an inverse process of coding.

Fig. 7 shows a block diagram of the MPEG decoder according to the prior art.

In Fig. 7, the MPEG decoder comprises a variable length decoder (VLD) 51, an inverse-quantizer 52, an inverse-DCT 53, an adder 54, a memory 55 for a picture and a predictor 56 for motion compensation.

With respect to an insertion frequency of electronic watermark signals in the prior art mentioned above, it almost depends upon an application. For example, in a case of picture data, electronic watermark signals are scattered by using several frames of pictures with depending upon a method of electronic watermark. In this case, it shall be a configuration of combining several frames. Otherwise there is existed a problem that an electronic watermark signal can not be read out. Further, a case that an electronic watermark signal is recorded in one frame at each several frames can be considered. In this case, there is existed another problem that an electronic watermark signal may disappear from a frame recorded with an electronic watermark signal if a frame not recorded with an electronic watermark signal is extracted.



An electronic watermark signal is not always recorded in a data, which is extracted from a specific area in a frame, even though an electronic watermark signal is recorded in each frame.

Furthermore, in a case of audio data, there is existed a case that electronic watermark signals are scattered in the audio data by using a specific number of samples. In this case, it shall be a configuration of combining the specific number of samples. Otherwise further problem that an electronic watermark signal can not be read out occurs.

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## SUMMARY OF THE INVENTION

Accordingly, in consideration of the above-mentioned problems of the prior art, an object of the present invention is to provide a recording apparatus and a recording method of an electronic watermark, which can hold an electronic watermark signal of which content is always equivalent to a first electronic watermark signal while extracting a contents data of a less amount of information than a predetermined unit of information from an original contents data, wherein the original contents data is recorded with the first electronic watermark signal by each or throughout the predetermined unit of information.

15  
20

In order to achieve the above object, the present invention provides, according to an aspect thereof, a recording apparatus of an electronic watermark comprising a detecting device for detecting a first electronic watermark signal from an original contents data inputted, a memory device for storing the first

electronic watermark signal detected by the detecting device temporarily, an extracting device for extracting a part of contents data from the original contents data and an inserting device for recording a second electronic watermark signal of which content is equivalent to that of the first electronic watermark signal detected by the detecting device in the contents data extracted by the extracting device.

According to another aspect of the present invention, there provided a recording method of an electronic watermark comprising a step of detecting a first electronic watermark signal from an original contents data inputted, a step of storing the first electronic watermark signal detected in the step of detecting temporarily, a step of extracting a part of contents data from the original contents data and a step of inserting a second electronic watermark signal of which content is equivalent to that of the first electronic watermark signal in the contents data extracted in the step of extracting.

Other object and further features of the present invention will be apparent from the following detailed description when read in conjunction with the accompanying drawings.

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## BRIEF DESCRIPTION OF DRAWINGS

Fig. 1 shows a block diagram of a recording apparatus of an electronic watermark according to a first embodiment of the present invention.

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Fig. 2 shows a block diagram of a recording apparatus of an

electronic watermark according to a second embodiment of the present invention.

Fig. 3 shows a block diagram of an encoding section in a recording apparatus of an electronic watermark according to a third embodiment of the present invention.

Fig. 4 shows a block diagram of a decoding section in a recording apparatus of an electronic watermark according to the third embodiment of the present invention.

Fig. 5 shows a block diagram of a decoding section in a recording apparatus of an electronic watermark according to a fourth embodiment of the present invention.

Fig. 6 shows a block diagram of the MPEG encoder according to the prior art.

Fig. 7 shows a block diagram of the MPEG decoder according to the prior art.

## DETAILED DESCRIPTION OF THE PREFERRED EMBODIMENTS

[First Embodiment]

Fig. 1 shows a block diagram of a recording apparatus of an electronic watermark according to a first embodiment of the present invention.

In Fig. 1, a recording apparatus comprises a detector 1 of signal, a memory 2 for electronic watermark contents, an extractor 3 of contents signal and an inserter 4 of electronic watermark.

A contents information is inputted into the detector 1 and an

electronic watermark (first electronic watermark) signal is detected from the inputted contents information in the detector 1. The detected electronic watermark signal is temporarily stored in the memory 2. The inputted contents information is transmitted to the extractor 3 thereafter. In the extractor 3, a part of contents signal is extracted from an original contents signal. In a case of a picture signal, for example, a specific frame signal is extracted from an original picture signal. In a case of an audio signal, a specific part of audio signal is extracted from an original audio signal.

The electronic watermark signal temporarily stored in the memory 2 is transmitted to the inserter 4. In the inserter 4, an electronic watermark (second electronic watermark) signal of which content is equal to that of the detected electronic watermark (first electronic watermark) signal is additionally recorded in the contents signal extracted by the extractor 3.

In a case that a contents signal is a picture data, an electronic watermark signal is scattered in several frames by using some frames of picture by an electronic watermark system as mentioned above, that is, an electronic watermark signal is recorded over some frames of picture. In this case, the picture data shall be a configuration of combining several frames. Otherwise the electronic watermark signal can not be read out. Further, another case can be considered that an electronic watermark is recorded in one frame at each several frames. In this case, if a frame signal not recorded with an electronic watermark signal is extracted, the frame signal disappears from the picture data, which is extracted by the electronic watermark signal, as a matter

of fact. Furthermore, an electronic watermark signal is not always recorded in a data, which is extracted from a specific area in a frame, even though an electronic watermark signal is recorded at each frame. Moreover, in a case of audio data, an electronic watermark signal is scattered by using a specific number of samples as a same manner as the case of picture data. In this case, the audio data shall be a configuration of combining the specific number of samples. Otherwise the electronic watermark signal can not be read out.

10           In order to solve these problems, the inserter 1 shown in Fig. 1 records a new electronic watermark signal (second electronic watermark signal) of which content is equivalent to that of an originally recorded electronic watermark signal (first electronic watermark signal) by using a method of a less data amount of contents data necessary for inserting an electronic watermark or a less sampling number than that of the originally recorded electronic watermark (first electronic watermark) signal.

As an actual example, an original electronic watermark signal is scattered into 15 frames and the electronic watermark signal is recorded in a low signal level in consideration of deterioration of picture quality. When detecting such an electronic watermark signal, electronic signals of 15 frames are integrated and the integrated electronic signal is detected with increasing a signal to noise ratio (S/N) of the signal level. In a case that only one frame of signal is extracted from a picture data recorded with an electronic watermark signal being scattered throughout 15 frames and recorded, an electronic watermark information recorded in the frame can not be detected. Accordingly, the

original electronic watermark signal is previously stored in the memory 2 and a new electronic watermark signal of which content is equal to that of the original electronic watermark signal is produced, and then the new electronic watermark signal is recorded in the extracted one frame of the picture data with a higher signal level.

[Second Embodiment]

Fig. 2 shows a block diagram of a recording apparatus of an electronic watermark according to a second embodiment of the present invention.

In Fig. 2, a recording apparatus of an electronic watermark comprises a detector 1 of signal, a memory 2 for electronic watermark contents, an extractor 3 of contents signal, an inserter 4 of electronic watermark, a decider 5 for judging whether or not an electronic watermark signal is existed and a switch 6.

A contents information is inputted into the detector 1 and an electronic watermark (first electronic watermark) signal is detected from the inputted contents information in the detector 1. The detected electronic watermark signal is temporarily stored in the memory 2. The inputted contents information is transmitted to the extractor 3 thereafter. In the extractor 3, a part of a contents signal is extracted from an original contents signal.

The electronic watermark signal temporarily stored in the memory 2 is transmitted to the inserter 4.

The contents signal extracted by the extractor 3 is judged by the decider 5 whether or not an electronic watermark signal is recorded. A result of judgement is transferred to the switch 6. In a

case that the extracted contents signal is judged as being recorded with an electronic watermark signal, the switch 6 is connected to the decider 5 and the contents signal extracted by the extractor 3 is outputted as it is.

5           In a case that the extracted contents signal is judged as not being recorded with an electronic watermark signal, the switch 6 is connected to the inserter 4 and the contents signal recorded by the inserter 4 with the new electronic watermark signal (second electronic watermark signal) of which content is equal to that of  
10 the first electronic watermark signal is outputted through the switch 6.

          In the second embodiment, it is assumed that a contents data is a picture data and the picture data is recorded with a first electronic watermark signal at each predetermined number of  
15 pictures or throughout the predetermined number of pictures. In a case that a picture data of less number of pictures than the predetermined number of pictures is extracted from an original picture data, a second electronic watermark signal of which content is equivalent to that of the first electronic watermark can  
20 be recorded in the extracted picture data in a less number of pictures than the predetermined number of pictures.

          In a case that a picture data of a smaller area than a predetermined area is extracted from an original picture data recorded with a first electronic watermark signal in each  
25 predetermined area or throughout the predetermined area, a second electronic watermark signal of which content is equivalent to that of the first electronic watermark signal can be recorded in the extracted picture data in the smaller area than the

predetermined area.

Further, in a case that a contents data is an audio data and an audio data of a less number of samples than a predetermined number of samples is extracted from an original audio data recorded with a first electronic watermark signal in each  
5 predetermined number of samples or throughout the predetermined number of samples, a second electronic watermark signal of which content is equivalent to that of the first electronic watermark signal can be recorded in the extracted audio data,  
10 wherein the second electronic watermark is recordable in a less number of samples than the predetermined number of samples.

Furthermore, with assuming that a contents data is other data than picture such as a letter and an audio data, in a case that a contents data of a less number of samples than a predetermined  
15 number of samples is extracted from an original contents data recorded with a first electronic watermark signal in each predetermined number of samples or throughout the predetermined number of samples, a second electronic watermark signal of which content is equivalent to that of the first electronic  
20 watermark signal can be recorded in the extracted contents data in a less number of samples than that the predetermined number of samples.

[Third Embodiment]

25 This embodiment is an application of adopting the MPEG encoder shown in Fig. 6 and the MPEG decoder shown in Fig. 7 in a recording apparatus of an electronic watermark.

Fig. 3 shows a block diagram of an encoding section in a



recording apparatus of an electronic watermark according to a third embodiment of the present invention.

Fig. 4 shows a block diagram of a decoding section in a recording apparatus of an electronic watermark according to the  
5 third embodiment of the present invention.

In Fig. 3, an encoding section of a recording apparatus of an electronic watermark comprises an inserter 11 of an electronic watermark signal and an MPEG encoder 12. As shown in Fig. 3, the inserter 11 receives an intra-coded picture (intra-picture)  
10 location signal from the MPEG encoder 12 and records an electronic watermark signal if an inputted contents information is an intra-picture. Essentially, an intra-picture is distributed with a maximum amount of codes and is coded in picture quality of a highest S/N. Accordingly, it is considered that strong tolerance to  
15 an electronic watermark signal, which is hardly disappeared by a compression encoding. Finally, a compressed contents information is outputted from the MPEG decoder 12.

In Fig. 4, a decoding section of the recording apparatus of an electronic watermark comprises an MPEG decoder 13, a detector 1  
20 of signal, a memory 2 for electronic watermark contents, an extractor 3 of contents signal, an inserter 4 of electronic watermark, a decider 5 for judging whether or not an electronic watermark signal is existed and a switch 6.

As shown in Fig. 4, a contents information compressed by the  
25 encoding section shown in Fig. 3 is transmitted to the MPEG decoder 13 and decoded through the MPEG decoding process, and then the compressed contents information becomes an input contents information and transmitted to the detector 1. An

electronic watermark signal is detected from the input contents information by the detector 1, in other words, an electronic watermark signal recorded in an intra-picture is detected. The detected electronic watermark signal (first electronic watermark signal) is temporarily stored in the memory 2. The input contents information is transmitted to the extractor 3 thereafter. A part of a contents signal is extracted from an original contents signal in the extractor 3.

On the other hand, the electronic watermark signal stored temporarily in the memory 2 is transmitted to the inserter 4.

The contents signal extracted from the input contents information by the extractor 3 is judged by the decider 5 whether or not an electronic watermark signal is recorded. A result of judgement is transmitted to the switch. In a case that an electronic watermark signal is recorded, the switch 6 is connected to the decider 5 and the contents signal extracted by the extractor 3 is outputted as it is.

In a case that an electronic watermark signal is not recorded, the switch 6 is connected to the inserter 4. A contents signal recorded by the inserter 4 with a new electronic watermark signal (second electronic watermark signal) of which content is equal to that of a first electronic watermark signal is outputted through the switch 6.

[Fourth Embodiment]

Fig. 5 shows a block diagram of a decoding section in a recording apparatus of an electronic watermark according to a fourth embodiment of the present invention.

A recording apparatus in this embodiment utilizes a signal, which indicates an intra-picture outputted from an MPEG encoder.

In Fig. 5, a recording apparatus of an electronic watermark  
5 comprises an MPEG decoder 13, a detector 1 of signal, a memory 2 for electronic watermark contents, an extractor 3 of contents signal, an inserter 4 of electronic watermark, a decider 14 for judging a picture type and a switch 16.

As shown in Fig. 5, a contents information compressed by the  
10 encoding section shown in Fig. 3 is transmitted to the MPEG decoder 13. The MPEG decoder 13 transmits a picture-type information contained in the inputted compressed contents information, which is a picture signal of compression encoded by the MPEG system, to the decider 14. A contents signal extracted  
15 by the extractor 3 is judged by the decider 14 whether or not the contents signal is an intra-picture on a basis of the picture-type information. A result of judgment is transmitted to the switch 16. In a case that it is judged as an intra-picture, the switch 16 is connected to the decider 14. The contents signal extracted by the  
20 extractor 3, that is, a picture signal being inserted with an electronic watermark signal and judged as an intra-picture is outputted as it is.

In a case that it is judged as not an intra-picture, the switch  
16 is connected to the inserter 4. In the inserter 4, a new  
25 electronic watermark signal (second electronic watermark signal) of which content is equivalent to that of a first electronic watermark signal supplied by the memory 2 is recorded in the extracted contents signal, that is, a picture signal of not being an

intra-picture. The contents signal recorded with the second electronic watermark signal is outputted through the switch 16. The other blocks shown in Fig. 5, which are not depicted in this embodiment, are the same functions as those of the third  
5 embodiment shown in Fig. 4.

The third and fourth embodiments shown in Figs. 3 through 5 disclose that an electronic watermark signal is recorded in an intra-picture by using a characteristic of an intra-picture of which picture quality is most improved while the MPEG compression. In  
10 a case of extracting other picture data than an intra-picture when decoding, a new electronic watermark signal of which content is equivalent to that of an electronic watermark signal originally recorded in the intra-picture is recorded in the picture data to be extracted. Accordingly, an electronic watermark signal can be  
15 recorded efficiently and contents of the electronic watermark signal can be held even though data of a specific part of a contents information, which is compression encoded by the MPEG system, is extracted.

As mentioned above, according to the present invention, an  
20 electronic watermark signal of which content is equivalent to that of a first electronic watermark signal can always be held in an extracted contents data, while extracting the contents data of less amount of information than a predetermined unit of information from an original contents data recorded with the first electronic  
25 watermark signal in each predetermined unit of information or throughout the predetermined unit of information.

WHAT IS CLAIMED IS:

1. A recording apparatus of an electronic watermark comprising:

detecting means for detecting a first electronic watermark signal from an original contents data inputted;

memory means for storing the first electronic watermark signal detected by said detecting means temporarily;

extracting means for extracting a part of contents data from the original contents data; and

inserting means for recording a second electronic watermark signal of which content is equivalent to that of the first electronic watermark signal detected by said detecting means in the contents data extracted by said extracting means.

2. The recording apparatus of an electronic watermark in accordance with claim 1, said recording apparatus further comprising:

deciding means for judging whether or not there is existed the second electronic watermark; and

switching means for switching an output in accordance with a result of judgment by said deciding means.

3. The recording apparatus of an electronic watermark in accordance with claim 2, said recording apparatus further comprising MPEG encoder means, MPEG decoder means and another inserting means for receiving an intra-coded picture location signal from the MPEG encoder means, wherein said

inserting means records the first electronic watermark signal in a case that the original contents data is an intra-picture.

4. A recording method of an electronic watermark comprising steps of:

detecting a first electronic watermark signal from an original contents data inputted;

storing the first electronic watermark signal detected in said step of detecting temporarily;

extracting a part of contents data from the original contents data; and

inserting a second electronic watermark signal of which content is equivalent to that of the first electronic watermark signal into the contents data extracted in said step of extracting.

## ABSTRACT

A detector (1) of signal detects an electronic watermark (first  
electronic watermark) signal from an inputted contents data. The  
5 detected electronic watermark signal is temporarily stored in a  
memory (2) for electronic watermark contents. The temporary  
stored electronic watermark signal is transmitted to an inserter  
(4) of electronic watermark signal. In the inserter (4), an  
electronic watermark (second electronic watermark) signal of  
10 which content is equivalent to the detected electronic watermark  
(first electronic watermark) signal is additionally recorded in a  
contents signal, which is extracted by a extractor (3) of contents  
signal.

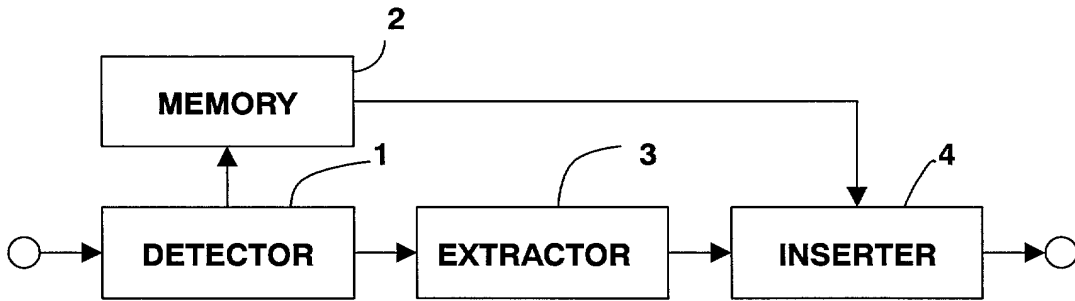


Fig. 1

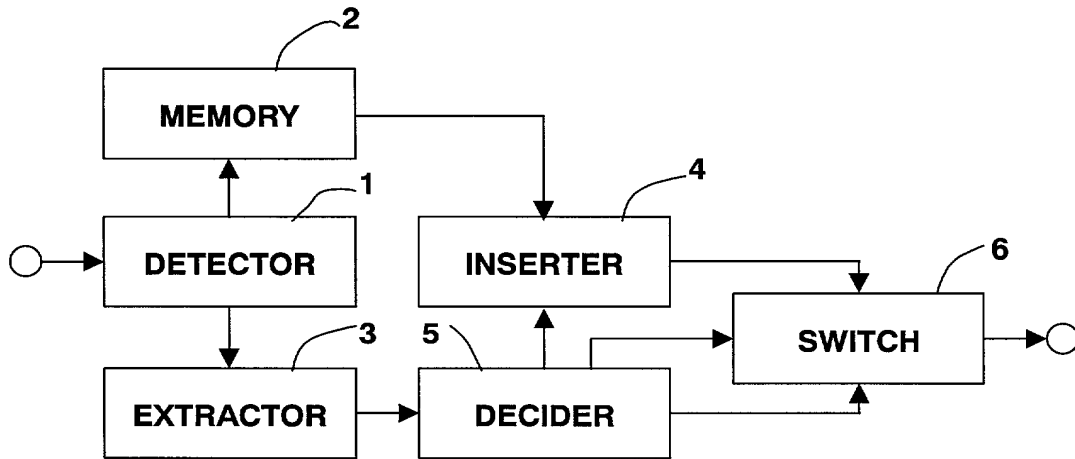


Fig. 2

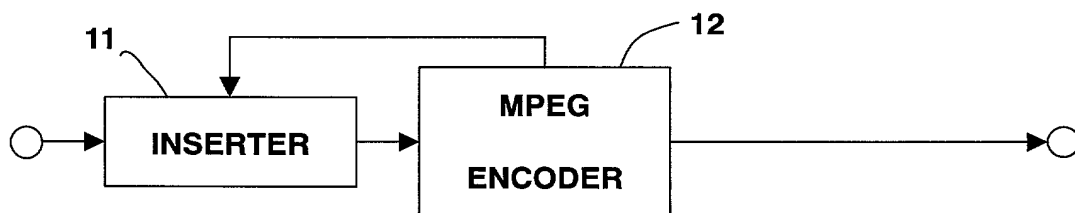


Fig. 3



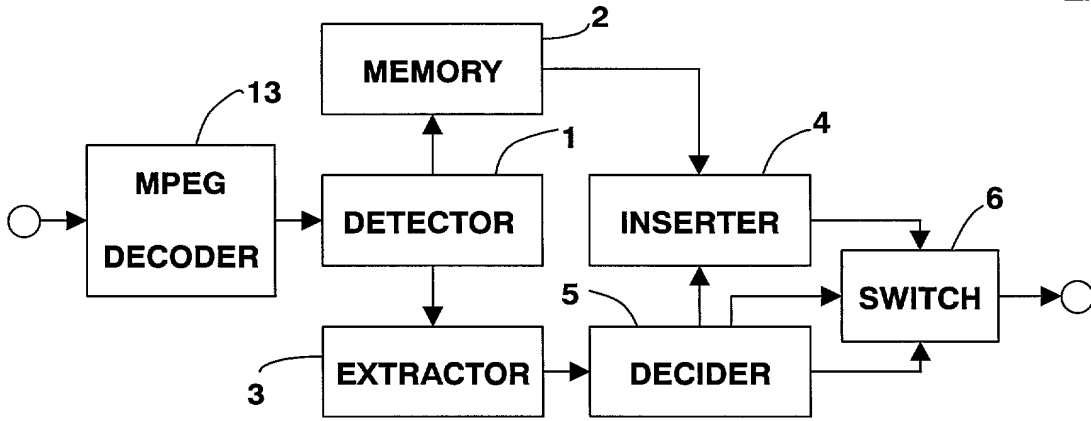


Fig. 4

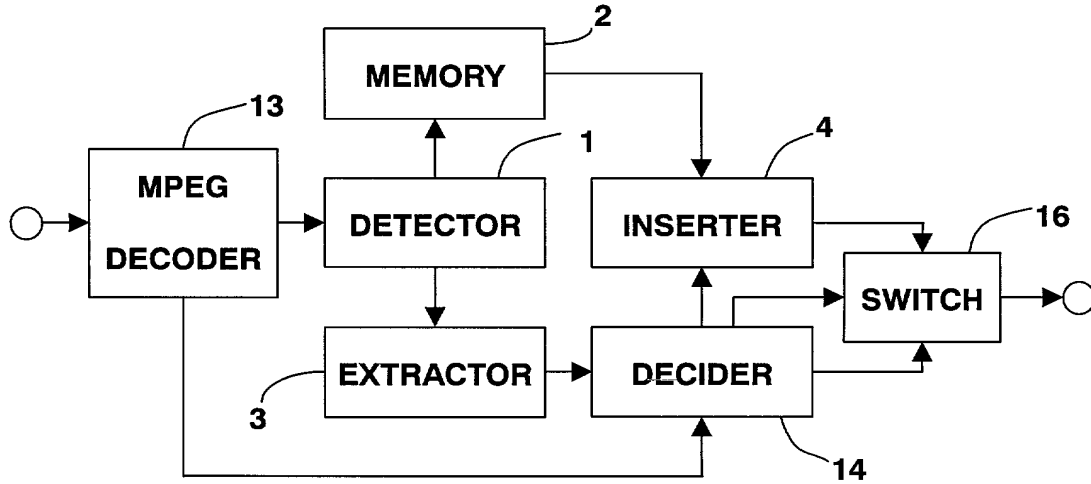


Fig. 5

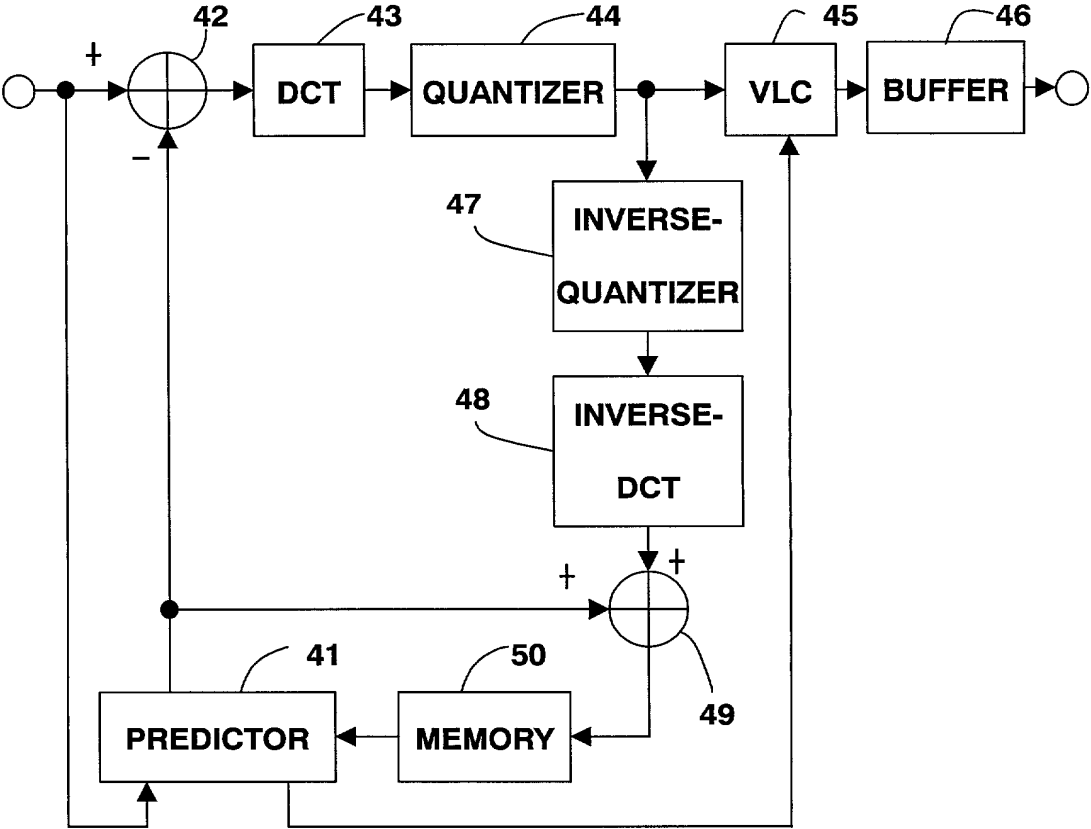


Fig. 6 Prior Art

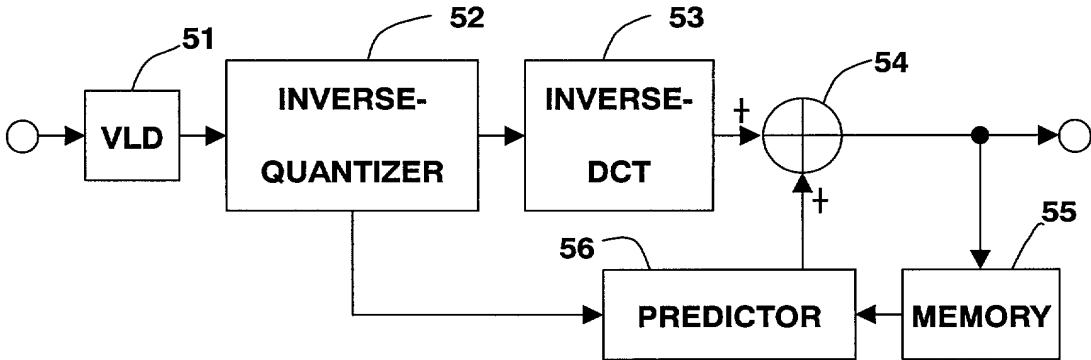


Fig. 7 Prior Art

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# Declaration and Power of Attorney For Patent Application

特許出願宣言書及び委任状

## Japanese Language Declaration

### 日本語宣言書

下記の氏名の発明者として、私は以下のとおり宣言します。

As a below named inventor, I hereby declare that:

私の住所、私書箱、国籍は下記の私の氏名の後に記載された通りです。

My residence, post office address and citizenship are as stated next to my name,

下記の名称の発明に関して請求範囲に記載され、特許出願している発明内容について、私が最初かつ唯一の発明者（下記の氏名が一つの場合）もしくは最初かつ共同発明者であると（下記の氏名が複数の場合）信じています。

I believe I am the original, first and sole inventor (if only one name is listed below) or an original, first and joint inventor (if plural names are listed below) of the subject matter which is claimed and for which a patent is sought on the invention entitled

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**RECORDING APPARATUS AND RECORDING METHOD OF ELECTRONIC WATERMARK**

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上記発明の明細書（下記の欄で×印がついていない場合は、本書に添付）は、

the specification of which is attached hereto unless the following box is checked:

\_\_月\_\_日に提出され、米国出願番号または特許協定条約国際出願番号を\_\_\_\_\_\_とし、  
(該当する場合)\_\_\_\_\_\_に訂正されました。

was filed on \_\_\_\_\_  
as United States application Number or  
PCT international Application Number  
\_\_\_\_\_ and was amended on  
\_\_\_\_\_ (if applicable).

私は、特許請求範囲を含む上記訂正後の明細書を検討し、内容を理解していることをここに表明します。

I hereby state that I have reviewed and understand the contents of the above identified specification, including the claims, as amended by any amendment referred to above.

私は、連邦規則法典第37編第1条56項に定義されるとおり、特許資格の有無について重要な情報を開示する義務があることを認めます。

I acknowledge the duty to disclose information which is material to patentability as defined in Title 37, Code of Federal Regulations, Section 1.56.

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### Japanese Language Declaration (日本語宣言書)

私は、米国法典第35編119条(a)-(d)項又は365条(b)項に基づき下記の、米国外の国の少なくとも一カ国を指定している特許協力条約365(a)項に基づく国際出願、又は外国での特許出願もしくは発明者証の出願についての外国優先権をここに主張するとともに、優先権を主張している、本出願の前に出願された特許または発明者証の外国出願を以下に、枠内をマークすることで、示しています。

I hereby claim foreign priority under Title 35, United States Code, Section 119(a)-(d) or 365(b) of any foreign application(s) for patent or inventor's certificate, or 365(a) of any PCT international application which designated at least one country other than the United States, listed below and have also identified below, by checking box, any foreign application for patent or inventor's certificate, or PCT international application having a filing date before that of the application on which priority is claimed:

Prior foreign application(s)  
外国での先行出願

Priority Not claimed  
優先権主張なし

11-179596/1999	Japan
(Number) (番号)	(Country) (国名)
(Number) (番号)	(Country) (国名)

25/June/1999	<input type="checkbox"/>
(Day/Month/Year Filed) (出願年月日)	
(Day/Month/Year Filed) (出願年月日)	<input type="checkbox"/>

私は、第35編米国法典119(e)項に基づいて下記の米国特許出願規定に記載された権利をここに主張します。

I hereby claim the benefit under Title 35, United States Code, Section 119(e) of any United States provisional application(s) listed below.

(Application No.) (出願番号)	(Filing Date) (出願日)

(Application No.) (出願番号)	(Filing Date) (出願日)

私は、下記の米国法典第35編120条に基づいて下記の米国特許出願に記載された権利、又は米国を指定している特許協力条約365条(c)に基づく権利をここに主張します。また、本出願の各請求範囲の内容が米国法典第35編112条第1項又は特許協力条約で規定された方法で先行する米国特許出願に開示されていない限り、その先行米国出願書提出日以降で本出願書の日本国内または特許協力条約国際提出日までの期間中に入手された、連邦規則法典第37編1条56項で定義された特許資格の有無に関する重要な情報について開示義務があることを認識しています。

I hereby claim the benefit under Title 35, United States Code, Section 120 of any United States application(s), or 365(c) or any PCT international application designating the United States, listed below and, insofar as the subject matter of each of the claims of this application is not disclosed in the prior United States or PCT international application in the manner provided by the first paragraph of Title 35, United States Code Section 112, I acknowledge the duty to disclose information which is material to patentability as defined in Title 37, Code of Federal Regulations, Section 1.56 which became available between the filing date of the prior application and the national or PCT international filing date of this application:

(Application No.) (出願番号)	(Filing Date) (出願日)

(Status: Patented, Pending, Abandoned) (現況: 特許特許済、係属中、放棄済)

(Application No.) (出願番号)	(Filing Date) (出願日)

(Status: Patented, Pending, Abandoned) (現況: 特許特許済、係属中、放棄済)

私は、私自身の知識に基づいて本宣言書中で私が行う表明が真実であり、かつ私の入手した情報と私の信じるところに基づく表明が全て真実であると信じていること、さらに故意になされた虚偽の表明及びそれと同等の行為は米国法典第18編第1001条に基づき、罰金もしくは禁錮、もしくはその両方により処罰されること、そしてそのような故意による虚偽の声明を行えば、出願した、又は既に許可された特許の有効性が失われることを認識し、よってここに上記のごとく宣誓を致します。

I hereby declare that all statements made herein of my own knowledge are true and that all statements made on information and belief are believed to be true; and further that these statements were made with the knowledge that willful false statements and the like so made are punishable by fine or imprisonment, or both, under Section 1001 of Title 18 of the United States Code and that such willful false statements may jeopardize the validity of the application or any patent issued thereon.

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TP99/01948

### Japanese Language Declaration (日本語宣言書)

委任状： 私は、下記の発明者として、本出願に関する一切の手続きを米国特許商標局に対して遂行する弁理士または代理人として、下記の者を指名致します。(弁護士、又は代理人の氏名及び登録番号を明記のこと)

POWER OF ATTORNEY: As a named inventor, I hereby appoint the following attorney(s) and/or agent(s) to prosecute this application and transact all business in the Patent and Trademark Office connected therewith. (list name and registration number)

Morris Liss, Registration No. 24,510

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第二共同発明者	Full name of second joint inventor, if any		
第二共同発明者の署名	日付	Second inventor's signature	Date
住所	Residence		
国籍	Citizenship		
私書箱	Post Office Address		

(第三以降の共同発明者についても同様に記載し、署名をすること。)

(Supply similar information and signature for third and subsequent joint inventors.)

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